

CLAIMS

What is claimed is:

1. A stretchable interconnect for electrically connecting electronic devices which are supported for movement relative to one another, comprising:  
a photolithographically patterned stretchable conductor extending between two of said devices for electrically coupling a contact of one device to a contact of another device, said conductor being comprised of a conductive material.
2. The stretchable interconnect as in claim 1 wherein said interconnect comprises a coiled conductor which as patterned has a stress gradient extending through at least a portion of the thickness of said conductor
3. The stretchable interconnect as in claim 1 wherein as photolithographically patterned said interconnect comprises at least one "V" shaped section.
4. The stretchable interconnect as in claim 3 wherein said interconnect comprises a plurality of "V" shaped sections.
5. The stretchable interconnect as in claim 2 wherein as photolithographically patterned and prior to coiling said interconnect comprises at least one "V" shaped section, which when unsupported forms said coil.
6. The stretchable interconnect as in claim 5 wherein said interconnect comprises a plurality of "V" shaped sections, which when unsupported forms said coil.

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7. The stretchable interconnect as in claim 2 wherein said coiled conductor is di-helic.

8. A sensor array comprising at least two electronic devices which are supported for movement relative to one another and at least one stretchable interconnect for connecting said electronic devices, said interconnect comprising: a photolithographically patterned stretchable conductor extending between said devices for electrically coupling a contact of one device to a contact of another device, said conductor being formed of a conductive material.

9. The sensor array as in claim 8 wherein said interconnect comprises a coiled conductor which as patterned has a stress gradient extending through at least a portion of the thickness of said conductor

10. The sensor array as in claim 8 wherein as photolithographically patterned said interconnect comprises at least one "V" shaped section.

11. The sensor array as in claim 10 wherein said interconnect comprises a plurality of "V" shaped sections.

12. The sensor array as in claim 9 wherein as photolithographically patterned and prior to coiling said interconnect comprises at least one "V" shaped section, which when unsupported, forms said coil.

13. The sensor array as in claim 12 wherein said interconnect comprises a plurality of "V" shaped sections, which when unsupported form said coil.

14. The sensor array as in claim 9 wherein said coiled conductor is di-helic.

15. The sensor array as in claim 9 which comprises a tactile sensing array.

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16. The sensor array as in claim 15 which comprises a tactile sensing portion of a robot.

17. The sensor array as in claim 16 wherein said sensor array is arranged in a flexible and stretchable skin of said robot.

18. The sensor array as in claim 9 which includes a plurality of said stretchable interconnects.

19. A process for making a stretchable interconnect for electrically connecting electronic devices which are supported for movement relative to one another, comprising:

forming said devices supported by a substrate, said devices being spaced apart from each other in said substrate;

depositing an interconnect conductor supported by said substrate for electrically coupling a contact of one device to a contact of another device,;

photolithographically patterning said interconnect conductor with a pattern which upon removal of said substrate from support of said interconnect conductor will cause said interconnect conductor to form a stretchable interconnect.

20. The process as in claim 19 wherein said interconnect conductor is formed with a stress gradient extending through at least a portion of the thickness of said conductor so that upon removal of said substrate from support of said interconnect conductor will cause said interconnect conductor to form a stretchable coil.

21. The process as in claim 20 wherein said interconnect comprises a coiled conductor which as patterned has a stress gradient extending through at least a portion of the thickness of said conductor
22. The sensor array as in claim 19 wherein as photolithographically patterned said interconnect comprises at least one "V" shaped section.
23. The sensor array as in claim 22 wherein said interconnect comprises a plurality of "V" shaped sections.
24. The process as in claim 20 wherein as photolithographically patterned and prior to substrate removal said interconnect conductor comprises at least one "V" shaped section, which when unsupported forms said coil.
25. The process as in claim 24 wherein said photolithographically patterned interconnect comprises a plurality of "V" shaped sections, which when unsupported forms said coil.
26. The process as in claim 20 wherein said interconnect conductor when unsupported is di-helic.
27. The process of claim 20 which comprises making a sensor array having at least two electronic devices and including a plurality of stretchable interconnect conductors connecting adjacent electronic devices.
28. The process as in claim 27 further comprising mounting said sensor array to a flexible and stretchable skin material.
29. The process as in claim 28 wherein said sensor array comprises a tactile sensing array.

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30. The process as in claim 29 further comprising mounting said sensor array to a tactile sensing portion of a robot.